

NUMERICAL SIMULATIONS OF BLAST WAVE PROPAGATION IN UNDERGROUND FACILITIES

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ABSTRACT

In this study we use the numerical method, Regularized Smoothed Particle Hydrodynamics (RSPH) to investigate the propagation of blast waves generated from high explosives detonated in underground facilities. The facility consists of a chamber connected to a straight tunnel with exit to free-field. The somewhat simplified configuration allows for symmetry assumptions to be made in the simulations. In the initial phase of the detonation we assume a spherically shaped high explosive and 1D simulations with spherical symmetry. The initial phase of the detonations is simulated using a constant volume model. When the shock approaches the walls of the construction, the results are mapped into an axis-symmetric configuration. The simulations are performed to investigate the maximum pressure distribution outside the entrance. The results are compared qualitatively to experiments, and comparable trends are found.